

MAY 10 2006

PTO/SB/21 (08-03)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>TRANSMITTAL FORM</b> (to be used for all correspondence after initial filing)		Application Number	10/029,849	
		Filing Date	12/20/2001	
		First Named Inventor	James Mckinnell	
		Group Art Unit	2814	
		Examiner Name	Anh D Mai	
Total Number of Pages in This Submission	7	Attorney Docket Number	HP3-061US	
<b>ENCLOSURES (check all that apply)</b>				
<input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached  <input type="checkbox"/> Amendment / Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Documents <input type="checkbox"/> Response to Missing Parts/Incomplete Application  <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s)		<input type="checkbox"/> After Allowance Communication to Group <input checked="" type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group ( <i>Appeal Notice, Brief, Reply Brief</i> ) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input type="checkbox"/> Other Enclosure(s) ( <i>please identify below</i> ):
Remarks				
<b>SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT</b>				
Firm or Individual Name	William J. Breen, III/Reg. No. 45313			
Signature				
Date	May 10, 2006			
<b>CERTIFICATE OF TRANSMISSION/MAILING</b>				
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.				
Typed or printed name	Rabekah Glass			
Signature			Date	May 10, 2006

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

MAY 10 2006

PTO/SB/17 (12-04)

Approved for use through 07/31/2005. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995 no persons are required to respond to a collection of information unless it displays a valid OMB control number

Effective on 12/08/2004.  
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4819).**FEE TRANSMITTAL**  
**For FY 2005**☐ Applicant claims small entity status. See 37 CFR 1.27**TOTAL AMOUNT OF PAYMENT** (\$ ) 0.00**Complete if Known**

Application Number	10/029,649
Filing Date	12/20/2001
First Named Inventor	James Mckinnell
Examiner Name	Anh D Mai
Art Unit	2814
Attorney Docket No.	HP3 061US

**METHOD OF PAYMENT** (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): \_\_\_\_\_

☒ Deposit Account Deposit Account Number: 12-0769 Deposit Account Name: Lee & Hayes, PLLC

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee

☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

**2. EXCESS CLAIM FEES**

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims	Fee (\$)	Fee Paid (\$)
- 20 or HP =		50				
HP = highest number of total claims paid for, if greater than 20						
Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)			
- 3 or HP =		200				
HP = highest number of independent claims paid for, if greater than 3						

**3. APPLICATION SIZE FEE**

If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 =		/ 50 =		
		(round up to a whole number) x		

**4. OTHER FEE(S)**

Non-English Specification, \$130 fee (no small entity discount)

Other: \_\_\_\_\_

**SUBMITTED BY**

Signature		Registration No. (Attorney/Agent)	45313	Telephone (509) 324-9256
Name (Print/Type)	William J. Breen, III	Date	5/1/06	

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

RECEIVED  
CENTRAL FAX CENTER

MAY 10 2006

PATENT APPLICATION  
Docket No. HP3-061US

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of		)
		)
	McKinnell, James	)
		)
Serial No.:	10/029,649	) Appeal No.
		)
Confirmation No.	5091	)
		)
Filed:	September 6, 2001	)
		)
For:	Silicide Bond with Integral Surface Getter	)
		)
		)
Examiner:	Mai, Anh D.	)

The Honorable Commissioner of Patents  
Mail Stop Appeal Brief - Patents  
P.O. BOX 1450  
Alexandria, VA 22313-1450

**REPLY BRIEF OF APPELLANT**

The Appellant has filed a timely Notice of Appeal from the action of the Examiner in finally rejecting all of the claims that were considered in this application. This Brief is being filed under the provisions of 37 C.F.R. § 1.193.

### ARGUMENT

The First Ground of rejection at issue in the present appeal is whether claims 1, 3-4, 6-10, 12, 14-16, 33 and 34 were properly rejected under 35 U.S.C. § 103(b) as being obvious over U.S. Patent No. 6,118,181 to Merchant et. al (hereinafter "Merchant") in view of by U.S. Patent No. 5,702,962 to Terasawa (hereinafter "Terasawa"). The Second Ground of Rejection is whether claims 2, 11, and 17 were properly rejected under 35 U.S.C. § 103(b) as being obvious over Merchant in view of Terasawa in further view of U.S. Patent No. 5,668,033 to O'Hara et al. (hereinafter "Ohara"). The Appellant respectfully submits that a *prima facie* case of obviousness has not been established in either of these rejections.

The Examiner, in the Examiner's Answer, again asserts the following:

Regarding the term "such that the alloy is sufficient to remove a native oxide from an interface surface between the bond structure and the first substrate", note that, there are [sic] no native oxide existed [sic] between the bond structure and the first and second substrates of Terasawa '962 and Merchant '181, therefore, the claimed term is met. Furthermore, neither the specification nor the claims define composition of the metal alloy, thus the metal alloy Terasawa meets the claimed sufficient to remove native Oxide. *See Examiner's Answer, Page 5.*

This is still not the case.

Terasawa states that the "naturally formed oxide film is then removed with hydrofluoric acid as needed, and the N.sup.- substrate 10 and the N.sup.+ substrate 20 are subjected to ultrasonic cleaning with purified water and dried by a spin dryer at room temperature." *Terasawa, Col. 4, Lines 47-50.* Therefore, the bond structure does not remove the native oxide, but rather hydrofluoric acid and ultrasonic cleaning are relied upon, after

which the bond is formed. Therefore, it is readily apparent that Terasawa cannot be said to teach a bond structure having an “alloy is sufficient to remove a native oxide from an interface surface between the bond structure and the first substrate” as recited in Claim 1. If such an alloy were taught or suggested in Terasawa, such cleaning would not be needed. “[I]t is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification.” *In re Lahu*, 747 F.2d 703, 223 USPQ 1257, 1258 (Fed. Cir. 1984). Accordingly, a person of ordinary skill in the art would not, upon a careful reading of Terasawa, arrive at the bond structures as claimed.

Additionally, the Examiner, in the *Response to Argument*, incorrectly asserts that the Appellant argued the references separately. Examples of the Applicant addressing the references in combination may be found in each response that has been submitted as well as throughout the Appeal Brief, e.g., the last sentence of the last full paragraph of page 15. Therefore, this assertion is clearly in error.

Further, the Examiner has still not explained why a person of ordinary skill in the art, when viewing the Terasawa reference, would be motivated to form an alloy having a sufficient quantity of an oxide affinity material to remove a native oxide when, as acknowledged by the Examiner, the native oxide has already been removed by cleaning. Again, the alloy of Terasawa clearly does not support this feature because if it did, cleaning of the oxide beforehand as explicitly taught by Terasawa would not be required. Rather, the Examiner seems to argue functionality based on mere existence of a component, even though that functionality is clearly taught away from in the very same reference. As is well settled, “A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention.” *M.P.E.P. 2141.02*, citing *W.L. Gore &*

*Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

Yet further, the Examiner asserts at the bottom of page 4 of Examiner's answer, with respect to claim 1, "[w]ith respect to oxide affinity material, Sb, is a metal well known to have an affinity for oxygen higher than that of the material (Si)" and also at the bottom of page 5 in regards to claims 7 and 8, the Examiner asserts that "the alloy (62, Au-Sb) . . . is composed of noble metal (Au) alloyed with an oxide affinity material (Sb), thus, more probable than not should have a free energy less than a range from [sec] about -200 Kcal/mole to about -205 Kcal/mol, as claimed." First, it is respectfully submitted that the standard "more probable than not" does not satisfy the requirements for an obviousness rejection. For instance, the Examiner seems to admit that an undue amount of experimentation would be required when viewing the references and even admits that the results of the proposed modification of the references are not guaranteed.

It is also respectfully submitted that in order for Examiner's argument to be correct, one of ordinary skill in the art would either have to have the knowledge of the temperature dependence of the free energy of formation of both Si reacting with oxygen and Sb reacting with oxygen, or the person would have to know the change in enthalpy and entropy of both Si and Sb reacting with oxygen and then know that the change in free energy ( $\Delta G$ ) is equal to the change in enthalpy ( $\Delta H$ ) minus the temperature times the change in entropy ( $T \times \Delta S$ ) to determine whether or not the reaction will proceed spontaneously. Another alternative to the latter is if one finds actual values of the free energy of formation for both Si and Sb oxides that are relevant then one can forego the calculation. Even with this thermodynamic information at hand one of ordinary skill in the art would then still have to recognize that the kinetics of the reaction will dominate whether the reaction will take place in a reasonable

time. Therefore, it is respectfully submitted that one of ordinary skill in the art, from reading Terasawa alone or in combination with Merchant, would not have been motivated to find this information and modify the references based on this information and even if the person was so motivated, that as admitted by the Examiner the result is not guaranteed.

For at least these reasons, and the reasons previously argued in the Appeal Brief, Claims 1-4, 6-11, 14-17, 33 and 34 are allowable and the Appellant respectfully requests that the Board overturn both grounds of rejection.

### CONCLUSION

The Appellant respectfully considers this application to be in condition for allowance and respectfully requests the Board to overturn the final rejection and that the Examiner pass this application to allowance.

Dated this 10<sup>th</sup> day of May, 2006.

Respectfully submitted,



WILLIAM J. BREEN, III  
Attorney for Appellant  
Registration No. 45,313

LEE & HAYES PLLC  
421 W. Riverside Avenue, Suite 500  
Spokane, WA 99201  
Telephone: (509) 324-9256 (Ext. 249)